



**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Application No.: 09/903,059 Confirmation No.: 9375  
First Named Inventor: Bulucea, Constantin Filing Date: 10 July 2001  
Group Art Unit: 2814 Examiner: Farhani, D.  
Atty. Docket No.: NS-4971 US  
Title: Gate-Enhanced Junction Varactor  
Assignee(s): National Semiconductor Corporation

Mountain View, California  
1 September 2005

**MAIL STOP NON-FEE AMENDMENT  
COMMISSIONER FOR PATENTS  
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**RESPONSE TO RESTRICTION REQUIREMENT**

Sir:

This is in response to the Restriction Requirement mailed 5 August 2005 for the above patent application.

The Restriction Requirement specifies that restriction is required to one of the following inventions:

- I. Claims 17 - 37, 47 - 70, 109, 110, and 112 - 130 drawn to a semiconductor device; and
- II. Claims 38 - 46, 71 - 108, and 111 drawn to a method of using a semiconductor device<sup>1</sup>.

Claim 111 depends from structure Claim 110 and is intended to be a structure claim. However, the preamble of Claim 111 incorrectly previously provided that Claim 111 is a

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<sup>1</sup> Although the Examiner has characterized the claims in Group II as being "drawn to a method of using a semiconductor device", Applicant's Attorney would characterize certain of the claims in Group II as directed to methods of designing or/and making semiconductor devices. Nonetheless, the Examiner's characterization of the claims in Group II is accepted *arguendo* for the purpose of responding to the Restriction Requirement.

"method" claim. This error is corrected in the accompanying Supplemental Amendment. Accordingly, Claim 111 should be placed in Group I along with Claims 17 - 37, 47 - 70, 109, 110, and 112 - 130 drawn to a semiconductor device. That is, Group I should consist of structure (device) Claims 17 - 37, 47 - 70, and 109 - 130 while Group II consists of method Claims 38 - 46 and 71 - 108.

Subject to transferring Claim 111 to Group I, Applicant's Attorney provisionally elects Claims 17 - 37, 47 - 70, and 109 - 112 in Group I for prosecution in this application.

The Restriction Requirement is respectfully traversed.

The above application has gone through six substantive office actions to date, starting with the initial Office Action mailed 14 March 2002<sup>2</sup> and carrying up to the latest Office Action mailed 18 October 2004, and two requests for continued examination. Claims in Groups I and II were present in the application as filed and have been examined in all six office actions, including the initial 14 March 2002 Office Action.

The number of claims presented for examination has increased during prosecution. Forty-six claims were presented in the application as filed. Disregarding the 16 claims canceled in the Amendment submitted 13 June 2002 in response to the initial 14 March 2002 Office Action, twenty-one of the claims examined in the 14 March 2002 Office Action fell into Group I while nine of the claims examined in the 14 March 2002 Office Action fell into Group II.

In the course of the examination conducted during the next five office actions, the number of examined claims falling into Group I increased from 21 to 59 immediately before the latest substantive office action, i.e., the 18 October 2004 Office Action. Group I now contains 67 claims. The number of claims falling into Group II increased from nine to 47 immediately before the 18 October 2004 Office Action and is currently at that point.

The total number of claims present in the above application is now 114, including nine independent claims. Each of Groups I and II has more than 20 claims, including more than three independent claims.

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<sup>2</sup> The Office Action mailed 4 March 2002 is not included in the number of substantive office actions because the 14 March 2002 Office Action was substantially identical to, and replaced, the 4 March 2002 Office Action.

A restriction requirement between structure claims falling into Group I and method claims falling into Group II might have been appropriate if the restriction requirement had been imposed before the initial 14 March 2002 Office action or possibly after the 14 March 2002 Office Action but before the second substantive Office Action mailed 28 August 2002. However, it is now far too late in the prosecution of the above application to impose a restriction requirement between the structure claims in Group I and the method claims in Group II.

37 CFR 1.142 deals with restriction requirements. 37 CFR 1.142(a) states that "If two or more independent and distinct inventions are claimed in a single application, the examiner in an Office action will require the applicant in the reply to that action to elect an invention to which the claims will be restricted, this official action being called a requirement for restriction (also known as a requirement for division)".

37 CFR 1.142(a) further states that "Such requirement will normally be made before any action on the merits; however, it may be made at any time before final action". In regard to the preceding sentence in 37 CFR 1.142(a), the Manual of Patent Examining Procedure ("MPEP") states in section 811 that "This means the examiner should make a proper requirement as early as possible [emphasis added] in the prosecution, in the first action if possible, otherwise, as soon [emphasis again added] as the need for a proper requirement develops".

To the extent that there might be a need for a restriction requirement between the structure claims in Group I and the method claims in Group II, that need should have been evident prior to the initial 14 March 2002 Office Action and certainly prior to the second substantive office action, i.e., the 28 August 2002 Office Action. At the very latest, any need for a restriction requirement between the structure claims in Group I and the method claims in Group II should have been evident immediately prior to the third substantive Office Action mailed 17 March 2003 at which time the number of claims falling into Group I had risen to 45 while the number of claims falling into Group II had risen to 27.

The issuance of a restriction requirement at this point in the prosecution of the above application is inconsistent with the policy prescribed in the MPEP for issuing a delayed restriction requirement under the last sentence of 37 CFR 1.142(a). The present Restriction Requirement is not timely and is therefore inappropriate.

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Applicant's Assignee has incurred considerable attorney fees for preparation of the responses/amendments, especially the arguments for demonstrating patentability of the claims over the applied art, submitted in response to the six office actions. Since each of Groups I and II now contains more than 20 claims, including more than three independent claims, Applicant's Assignee has also incurred significant excess claim charges in having claims examined in both Groups I and II.

Had a restriction requirement between structure claims in Group I and method claims in Group II been issued prior to the 14 March 2002 initial Office Action or even before the 28 August 2002 second Office Action and had such a restriction requirement been made final, Applicant's Assignee would have then further pursued claims in only one of Groups I and II in the above application and would have avoided the considerable expense incurred in further pursuing both groups of claims in this application<sup>3</sup>. A refusal to withdraw the present Restriction Requirement would result in a considerable unnecessary waste of the money of Applicant's Assignee and would therefore be highly unfair to Applicant's Assignee. This is another reason why the Restriction Requirement is inappropriate.

Additionally, the MPEP states in section 802.01 that "If the search and examination of an entire application can be done without serious burden, the examiner must examine it on the merits, even though it includes claims to independent or distinct inventions".

There are four independent method claims in the above application. Three of the four independent method claims have independent structure counterparts. In particular, independent method Claims 71, 79, and 95 respectively correspond to independent structure Claims 17, 23, and 109. The knowledge gained by the Examiner in examining independent structure Claims 17, 23, and 109 and their dependent claims will significantly reduce the burden in further examining independent method Claims 71, 79, and 95 and their dependent claims. Consequently, the additional burden that the Examiner will incur in continuing to examine both groups of claims in the above application is small.

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<sup>3</sup> Should Applicant's Assignee later file a divisional U.S. patent application in order to pursue the non-elected claims as a result of the present Restriction Requirement being made final, Applicant's Assignee will still incur considerably more expense than if the Requirement is withdrawn or if a restriction requirement between structure claims in Group I and method claims in Group II had been issued at an appropriate early point during the prosecution.

Furthermore, the only rejections in the above application are prior art rejections. The Examiner does not have to deal with any 35 USC 112 rejections or unclarity objections. All of the 114 pending claims are allowable over the applied art for the reasons stated in the amendment submitted 17 January 2005. Subject to reviewing that amendment, all that the Examiner has to do in this application is to issue a notice of allowance. The additional burden that the Examiner will incur in continuing to examine both groups of claims should indeed be quite small. This is yet another reason why the Restriction Requirement is inappropriate.

As apparent justification for the Restriction Requirement, the Examiner alleges on page 2 of the Requirement that "In the instant case, for example, instead of adjusting the plate area to control the minimum and maximum capacitances of the varactor, the varactor of claim 17 can be used in circuitry with a single capacitance value at a time, which can be derived by applying a desired voltage to the gate of the capacitor [presumably 'varactor']"<sup>4</sup>. Applicant's Attorney cannot determine what the Examiner means by this allegation. If the Examiner continues to impose the Restriction Requirement using this allegation as justification for the Requirement, it is respectfully requested that the Examiner clarify the allegation.

Applicant's Attorney presents the following comments in regard to the Examiner's apparent justification for the Restriction Requirement.

Firstly, the five independent structure claims, including Claim 17, all recite structures that contain varactors. A varactor is an electronic device configured to have a capacitance that can be varied by applying one or more control signals to the varactor.

If, by alleging that "In the instant case, for example, instead of adjusting the plate area to control the minimum and maximum capacitances of the varactor, the varactor of claim 17 can be used in circuitry with a single capacitance value at a time, which can be derived by applying a desired voltage to the gate of the capacitor [again presumably 'varactor']", the Examiner is trying to assert that the varactor in the varactor-containing structure of Claim 17 could be used in circuitry where the varactor provides only one value of capacitance at any

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<sup>4</sup> Note that Claim 17 specifies that the plate-to-body voltage is varied while the gate-to-body voltage is maintained substantially constant. Hence, the capacitance of the varactor of Claim 17 is controlled by varying the plate-to-body voltage.

time and that the varactor could thus provide another value of capacitance at another time, this capability is the normal variable-capacitance capability of a varactor. Such an interpretation of the Examiner's allegation would not justify the Restriction Requirement.

If the Examiner is trying to assert that the varactor in the varactor-containing structure of Claim 17 could be used in circuitry where the varactor provides a fixed value of capacitance at all times, i.e., the varactor capacitance is permanently fixed, the varactor-containing structures of Claim 17 and the other independent structure claims are configured in particular ways to achieve the variable-capacitance capability. By using the varactor-containing structure of Claim 17, or of any of the other independent claims, in circuitry where the varactor capacitance is permanently fixed, a person skilled in the electronic circuitry art would not be taking advantage of the way in which the varactor-containing structure is configured to achieve the variable-capacitance capability. This would typically be a waste of money because the varactor-containing structure of Claim 17, or of any of the other independent structure claims, would typically be more expensive to manufacture than a simple fixed-capacitance capacitor. A person skilled in the electronic circuitry art would be extremely unlikely to find this interpretation of the Examiner's allegation as justification for the Restriction Requirement.

For the preceding reasons, the Restriction Requirement should be withdrawn.

Please telephone Attorney for Applicant(s) at 650-964-9767 if there are any questions.

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Respectfully submitted,

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